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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/688,017	10/16/2003	Byung-Jun Park	2522-044	4400
20575	7590	01/13/2005	EXAMINER	
MARGER JOHNSON & MCCOLLOM, P.C. 1030 SW MORRISON STREET PORTLAND, OR 97205			DUONG, KHANH B	
			ART UNIT	PAPER NUMBER
			2822	

DATE MAILED: 01/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/688,017

Applicant(s)

PARK ET AL.

Examiner

Khanh Duong

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 November 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 8-28 is/are pending in the application.
- 4a) Of the above claim(s) 1-7 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 21-28 is/are allowed.
- 6) ☒ Claim(s) 8-14 and 17 is/are rejected.
- 7) ☒ Claim(s) 15,16 and 18-20 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Response to Applicant's Election

This Office Action is in response to the Election filed on November 19, 2004.

Applicant's election **without** traverse of Group II, Claims 8-28 is acknowledged.

Therefore, Claims 1-7 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to nonelected inventions, there being no allowable generic or linking claim.

Accordingly, claims 8-28 are active in the application and an office action on the merits is as follows.

Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Specification

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: METHOD OF FABRICATING A SEMICONDUCTOR DEVICE HAVING SELECTIVE EPITAXIAL SILICON LAYER FORMED ON CONTACT PADS THROUGH CONTACT HOLES.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 8-10, 12-14 and 17 are rejected under 35 U.S.C. 102(e) as being anticipated by Weon et al. (U.S. Patent No. 6,472,303).

Re claim 8, Weon et al. ("Weon") discloses in FIG. 9 to 13 a method of manufacturing a semiconductor device comprising: forming wirings separated from each other on a semiconductor substrate 41, each of the wirings including a first conductive layer pattern 43 and an insulating mask layer pattern 45 formed on the first conductive layer pattern 43; forming insulating spacers 47 on sidewalls of the wirings; forming self-aligned contact pads 49 including portions of a second conductive layer, each of the self-aligned contact pads 49 making contact with surfaces of the insulating spacers 47 to fill a gap between the wirings; forming an interlayer dielectric layer 51 on the substrate 41 wherein the contact pads 49 are formed; partially etching the interlayer dielectric layer 51 to form contact holes 53 exposing the contact pads 49; and forming a selective epitaxial silicon layer 55 on the contact pads 49 exposed through the contact holes 53 to cover the insulating mask layer pattern 45 [see col. 4, ln. 11 to col. 5, ln. 20].

Re claims 9 and 10, Weon discloses the insulating mask layer pattern 45 and the insulating spacers 47 comprise silicon nitride based materials having etching selectivities inherently relative to the interlayer dielectric layer 51 [see col. 4, ln. 23-26 and 57-62].

Re claim 12, see discussion above regarding claim 8. Weon further discloses in FIG. 9 to 13 forming at least two self-aligned contact pads 49 using mask patterns (43, 45, 47) having bar shapes that include openings having at least two different contact regions, each of the at least two self-aligned contact pads 49 in contact with portions of the substrate 41 between the wirings;

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forming an interlayer dielectric layer 51 on the substrate 41 where the at least two self-aligned contact pads 49 are formed; partially etching the interlayer dielectric layer 51 to form a contact hole 53 exposing one of the at least two self-aligned contact pads 49; and forming a selective epitaxial silicon layer 55 on the one of the at least two self-aligned contact pads 49 to cover the insulating mask layer pattern 45.

Re claims 13 and 14, see discussion above regarding claims 9 and 10.

Re claim 17, Weon expressly discloses in FIG. 12 the contact hole 53 is formed to have a line shape so that the one of the at least two self-aligned contact pads 49 and another self-aligned contact pad 49 arranged in a direction substantially parallel to the wirings are simultaneously exposed through the contact hole 53.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

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This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Weon in view of Balasubramanian et al. (U.S. Patent No. 6,468,853).

Re claim 11, Weon discloses forming the epitaxial silicon 55 from another epitaxial silicon 49, instead of doped polysilicon.

Balasubramanian et al. ("Balasubramanian") suggests in FIG. 4 and 5 forming an epitaxial silicon 22 from a layer 20 comprising polysilicon, epitaxial silicon or amorphous silicon [see col. 4, ln. 13-37].

Since Weon and Balasubramanian are from the same field of endeavor, the purpose disclosed by Balasubramanian would have been recognized in the pertinent prior art of Weon.

Thus, because forming epitaxial silicon from another epitaxial silicon or polysilicon were art-recognized equivalent techniques as demonstrated by Weon and Balasubramanian at the time the invention was made, one of ordinary skill in the art would have found it obvious to substitute one technique for the other.

Allowable Subject Matter

Claims 15, 16 and 18-20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 21-28 are allowed.

The following is a statement of reasons for the indication of allowable subject matter:

Re claim 21, none of the prior art of record, taken alone or in combination, fairly discloses the combined steps of: forming first contact pads connected to the storage node contact regions and second contact pads connected to the bit line contact regions using self-aligned contact mask patterns having bar shapes that include openings exposing the active regions; forming an interlayer dielectric layer on the substrate where the first and second contact pads are formed; partially etching the interlayer dielectric layer to form storage node contact holes having line shapes so that one first contact pad and an adjacent first contact pad arranged in a direction substantially parallel to the gate lines are exposed by each of the storage node contact holes; forming a selective epitaxial silicon layer on the first contact pads exposed by the storage node contact holes to cover the gate mask layer patterns; and forming storage node contact plugs in the storage node contact holes, wherein the storage node contact plugs are electrically connected to the first contact pads.

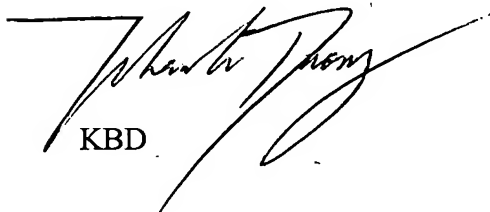
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Khanh Duong whose telephone number is (571) 272-1836. The examiner can normally be reached on Monday - Thursday (9:00 AM - 6:00 PM).


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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on (571) 272-1852. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



KBD



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